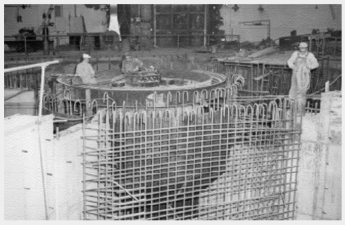
The Reactor Vessel

Taking Apart the Vessel Walls
Phase 4



The reactor vessel (as seen in this construction photo) will be taken apart piece by piece during segmentation.

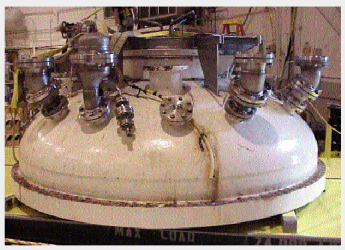
The vessel tank is 9 feet in diameter and 32 feet high.

It consists of a carbon steel shell with an overlay of stainless steel.

Records indicate that the vessel walls are covered with a thick blanket of asbestos and up to ten feet of concrete reinforced with fifty percent metal bars (rebar).

The reactor vessel is located entirely below grade.

Access to the tank is from the zero foot level platform called the lily pad.



Workers unbolted and removed the Reactor Pressure Vessel Head from the reactor tank in early September.

Dismantling the vessel walls has been described as peeling an orange from the inside out. The construction materials (concrete, metals, etc.) that made the vessel strong are the same materials that need to be systematically taken apart during segmentation. Workers will use remote handling tools to methodically unbolt, mill and cut the walls to pieces according to the specifications that have been fully described in the segmentation plan.

Asbestos Abatement

Before dismantling takes place, workers must use remote boring tools to take samples of the walls for asbestos content analysis. An on-site lab has been set up to analyze both radioactive and non-radioactive samples. Asbestos abatement will be conducted, where necessary, as workers dismantle the walls.

Pipe Removal

Eighty-nine penetrations - the number of pipes and hatches that go through the reactor - must be removed before workers can dismantle the vessel walls. These range from the two 24-inch primary cooling water penetrations (cold water in, hot water out) to control rod ports, to the half-inch sampling lines.

Pipe Removal Process

Insert a remote cutting tool into the penetrating pipe from inside of the tank,

Push the tool in past the thickness of the tank wall,

Cut from inside the pipe outward,

Remove that piece of tank wall,

Remove the remaining piping from the vessel wall piece.

Packaging & Shipping

As each piece is removed from the vessel it will be size-reduced to specifications in the segmentation plan according to its size, weight, shape and level of radioactivity. Vessel pieces will be put in specific liners specified in the segmentation packaging plan.

Segmentation will generate dry, solid, Class A, Class B, and Class C low-level radioactive waste (LLRW).

TOTAL SHIPMENTS FROM SEGMENTATION:

- Five SeaLand containers and one Type A (14-170) cask to Envirocare of Utah, Inc.
- Two Type B casks and five type B/C Insitu casks to Barnwell LLRW Disposal Facility in South Carolina.

Clean Up & Demobilization
Phase 5

After the vessel walls have been completely removed, workers will clean up and inspect the reactor vessel cavity and all work areas inside the Reactor Facility.

With reactor internals removal and vessel segmentation complete, NASA will have significantly reduced the amount of on-site radioactivity and will have accomplished a major decommissioning milestone.